Unusual use of objects after unilateral brain damage. The technical reasoning model

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Résumé en anglais	It has been suggested that gesture engrams, conceptual knowledge and/or the ability to infer function from structure can support object use. The present paper proposes an alternative view which is based upon the idea that object use requires solely the ability to reason about technical means provided by objects. Technical means are abstract principles which are not linked with any object representation (e.g., cutting involves the opposition between dense and permeable material). The technical reasoning model predicts that the inability to perform technical reasoning should impair performance in any situation requiring the use of objects (in a conventional way or not). Twenty left brain-damaged (LBD) patients, 11 right brain-damaged (RBD) patients and 41 healthy controls were examined on experimental tests assessing the conventional use of objects (e.g., screwing a screw with a screwdriver), conceptual knowledge about object function, pantomime of object use and recognition of object utilization gestures. We also designed the Unusual Use of Objects Test, which demands unusual applications of objects to achieve a purpose for which the usually applied object is not provided (e.g., screwing a screw with a knife). The key findings are that only LBD patients have more difficulties on the Unusual Use of Objects Test than controls or RBD patients, and that the severity of their impairment is correlated with that on conventional use of objects. Correlations with tests assessing conceptual knowledge as well as with tests of pantomime of object use and recognition of object utilization gestures were weaker. These results support the technical reasoning model and question the role of conceptual knowledge and gesture engrams in object use. Since the technical reasoning model also predicts two distinct technical disorders, the discussion focuses on the existence of these disorders in regard to individual performance profiles obtained in the Unusual Use of Objects Test.
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